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NOMENCLATURAL CHANGES IN BROMUS

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Bromus inermis Leyss. (sect. *Bromopsis* Dumort.), a native of Europe, Siberia, and China, has apparently become more widespread in North America than any one of the native species of *Bromus*. Its introduction into North America preceded the first recognition of the closely related *B. Pumpellianus* Scribn. When Shear published his "Revision of the North American Species of *Bromus* Occurring North of Mexico" in 1900, he said in his discussion under *B. Pumpellianus*, "The difficulties of separating these species [i. e. *B. inermis* and *B. Pumpellianus*] are likely to be greatly increased in the future by the rapid distribution of the cultivated forms of *B. inermis* in the region occupied by *B. Pumpellianus* and also by the probability of hybridization of the two plants".

Later, in 1942, Hultén postulated that *B. Pumpellianus* was the American counterpart of *B. inermis*, and that its varieties *arcticus* and *villosissimus*, as well as the Kamchatkan *B. ornans* Kom. were northern variations of this complex. In 1949, Elliott also felt that *B. ornans* Kom., *B. Korotkyi* Drob., *B. irkutensis* Kom., *B. vogulicus* Soczava, *B. Richardsonii* Link, and *B. sibiricus* Drob. as treated by Nevski and Sochava (1934) could be included in the complex.

At this time F. C. Elliott also outlined the North American distribution of *B. Pumpellianus* and *B. inermis*. He presented evidence to show the presence of intermediate forms, and postulated that "introgression of the two" was taking place in the range of *B. Pumpellianus*. He felt that the hybridization be-

tween the two species was largely confined to modified habitats. Artificially reproduced F_1 hybrids between the two octoploid species were found to be moderately fertile under open-pollination. Using this evidence, Elliott reasoned that recent divergence of the two species from an Asiatic center of germplasm was suggested. A migration, he believed, took place in a Pleistocene era when cool, moist conditions prevailed over a large area of North America. Elliott concluded that *B. Pumpellianus* should be reduced to a subspecies of *B. inermis*, but did not make the necessary nomenclatural changes.

I have recently completed an intensive study (unpublished) of the North America members of *Bromus*, section *Bromopsis*. During the course of this study it became evident that the morphological differences between *B. Pumpellianus* and *B. inermis* were less than those prevailing between other pairs of closely related species of *Bromopsis*. This, in addition to the many features which the two have in common (e. g. both are octoploids, both have creeping rootstocks which are wanting in most of the other species of the section, and both have a northern range of distribution), and in addition to the presence of many intermediates between the two supposed species, strengthens Elliott's contention that the two are no more than sub-specifically different. The following combinations are necessary.

BROMUS INERMIS Leyss. subsp. **inermis** (Leyss). Wagnon, stat. nov. *B. inermis* Leyss., Fl. Hal. 16. 176¹. *Festuca inermis* DC. & Lam. Fl. Franç. 3: 49. 1805. *Schedonorus inermis* Beauv., Ess. Agrost. 99, 177. 1812. *Festuca inermis* var. *villosa* Mert. & Koch, Deutschl. Fl. 1: 675. 1823. *B. inermis* var. *aristatus* Schur, Enum. Pl. Transsilv. 805. 1866. *B. inopinatus* Brues, Trans. Wis. Acad. 17: 73. 1911. *Forasaccus inermis* (Leyss.) Lunell, Am. Midl. Nat. 4: 225. 1915. *Zerna inermis* (Leyss.) Lindm., Svensk. Fanerogamfl. 101. 1918. *B. ciliatus* subv. *denudatus* (Wieg.) Farwell, Am. Midl. Nat. 10: 204, as to plant only. 1927. *B. inermis* forma *villosum* (Mert. & Koch) Fernald, RHODORA, 35: 316. 1933. *B. inermis* forma *aristatus* (Schur) Fernald, RHODORA 35: 316. 1933.

This subspecies may be readily distinguished from the following one by its glabrous blades and by the glabrous nodes which are usually 3-5 in number.

¹ No attempt has been made to search for synonymy of *B. inermis* in foreign literature; only those names found in American works are listed.

BROMUS INERMIS subsp. **Pumpellianus** (Scribn.) Wagnon, stat. nov. *B. Pumpellianus* Scribn., Bull. Torrey Bot. Club **15**: 9. 1888. TYPE: *F. Lamson-Scribner* 418; collected in 1883 in the Belt Mountains, Montana; seen in the U. S. National Herbarium.

This subspecies is best identified by its blades which are pilose at least on the upper surface and by the pubescent nodes which are 2 or 3 in number. In North America it is represented by the two following varieties, both of which are apparently capable of hybridizing with the subsp. *inermis*.

BROMUS INERMIS var. **purpurascens** (Hook.) Wagnon, stat. nov. *B. purgans* var. *purpurascens* Hook., Fl. Bor.-Amer. **2**: 252. 1840. *B. purgans* var. *longispicata* Hook., Fl. Bor.-Amer. **2**: 252. 1840. *B. Pumpellianus* Scribn., Bull. Torrey Bot. Club **15**: 9, as to the type. 1888. *B. ciliatus* var. *coloradensis* Vasey ex Beal, Grasses N. Amer. **2**: 619. 1896. *B. Pumpellianus* var. *Tweedyi* Scribn. ex Beal, Grasses N. Amer. **2**: 622. 1896. *B. Pumpellianus* var. *melicoides* Shear, U. S. Dept. Agr., Div. Agrost. Bull. **23**: 50. 1900. *Forasaccus Pumpellianus* (Scribn.) Lunell, Am. Midl. Nat. **4**: 225. 1915. TYPE: Arctic shore, Dr. (Sir John) Richardson; seen at the Royal Botanic Gardens, Kew, England.

Distinguished from the following variety by its glabrous glumes and by the lemmas which are pubescent along the margins, on the main nerves and on the base of the back. From Colorado in the Rocky Mountains to well inside the Arctic Circle in Alaska, Yukon and Northwest Territory.

BROMUS INERMIS var. **arcticus** (Shear) Wagnon, stat. nov. *B. arcticus* Shear, in Scribn. & Merr., Contr. U. S. Nat. Herb. **13** (3): 83. 1910. *B. Pumpellianus* var. *arcticus* (Shear) A. E. Porsild, RHODORA **41**: 182. 1939. *B. Pumpellianus* var. *villosissimus* Hultén, Fl. Alaska and Yukon. Lunds Univ. Årssk. II. Sect. 2. 38: 251. 1942. TYPE: *T. A. Walpole* 2036, Sept. 9, 1901; collected in the vicinity of Port Clarence, tundra bank near buildings at Teller Reindeer Station, Seward Peninsula, Alaska; seen in the U. S. National Herbarium (No. 379157).

This variety is readily identified by its sparsely pubescent to hirsute glumes and lemmas. Except for a single collection from Michigan, it is confined to Alaska, Yukon and the Northwest Territory.

The identity of *Bromus purgans* L. has been the subject of some controversy. Linnaeus described in the *Species Plantarum* (1753) two American species of *Bromus*, namely *B. purgans* and

B. ciliatus. The latter, though apparently not represented in the Linnaean Herbarium (Hitchcock 1908), is sufficiently well characterized by mention of the lemmas as having only the margins pilose "*petalorum marginibus (non dorso) valde pilosis*". The description of *Bromus purgans*, however, while unusually ample for the *Species Plantarum*, is applicable to at least three American species, namely *B. purgans*, *B. latiglumis* and *B. Kalmii* as currently interpreted. All three of these species may have the lemmas uniformly pubescent on the backs as well as on the margin; the original description of *B. purgans* reads: "*Glumae pilis brevissimis undique extus villosae*".

Bromus purgans was based primarily upon material collected by Kalm in "Canada". Linnaeus doubtfully included in the synonymy of this species the "*Gramen bromoides catharticum*" of Feuillée: "*Differt nostra a Fewillaei radicibus fibrosis nec squamosis; spiculis angustioribus*". Feuillée's plant (1714) was South American in origin, and his plate appears to represent a member of the section *Ceratochloa*. Some authors have for this reason referred several plants of the section *Ceratochloa* to *B. purgans*, as pointed out by Shear (1900). It seems very clear, however, from Linnaeus' definite reference to Kalm's collection, which he described fully, that this collection must be regarded as the type of the species.

In 1907, Hitchcock (1908) visited the Linnaean Herbarium in order to study species that were based wholly or in part upon American material. He found three specimens of *Bromus*, any one of which could have been taken from material collected by Kalm, and all of which had lemmas uniformly pubescent across the backs. Photographs of these specimens were seen in the United States National Herbarium and at the Arnold Arboretum, Harvard University. I am greatly indebted to Dr. W. R. Taylor, Department of Botany, University of Michigan, who, in June, 1950, made a critical examination of the Linnaean specimens for specific characters in order to help solve this problem.

For simplicity, these specimens may best be referred to by their catalogue numbers, 93.10, 93.11, and 93.12. Specimen number 93.10 is marked (Savage 1945) "*purgans* 3 HU" in Linnaeus' handwriting, and "all 3 [sheets 10 to 12, pinned together] one sp. & *purgans* not *ciliatus* ex char. A. Gray" in Asa Gray's

handwriting. I am in complete agreement with Hitchcock in identifying this specimen as the currently interpreted *B. latiglumis* (Shear) Hitchcock, as it has overlapping sheaths with a ring of hairs at their summit. Auricles are apparently not present, as Dr. Taylor was unable to find any; once dried, these structures are easily broken off, hence their absence on old specimens does not necessarily mean that they were never present. The above-mentioned sheath-condition, and a short exertion of the panicle are characteristic of *B. latiglumis* only. As Hitchcock pointed out, specimen 93.12 is also *B. latiglumis* as shown by overlapping sheaths, although the ring of hairs at the summit of the sheath is less conspicuous. This specimen bears the following marks- "4 HU" in Linnaeus' handwriting, and "*ciliatus*" in the handwriting of J. E. Smith.

Specimen number 93.11 is marked "4 K[alm]" in Linnaeus' handwriting and "*ciliatus*" in J. E. Smith's handwriting. Hitchcock (1908) believed this plant to be "*Bromus purgans* as commonly understood and as described in Shear's Monograph of *Bromus*, and [felt that it] should be taken as the type, in spite of the "4" placed upon the sheet by Linnaeus, probably inadvertently". It does not have overlapping sheaths and the panicle has flexuous pedicels as was noted by Hitchcock (mss. notes in U. S. Nat. Herb.). The flexuous condition evidently convinced Hitchcock that this was the plant Linnaeus had in mind when describing the panicle of *B. purgans* as "*crispa, flexuosa, nutans*". Hitchcock may have been right in believing it was the specimen Linnaeus had in mind, but it is not a specimen of the material that has been currently referred to *Bromus purgans*. Critical examination of this specimen by Dr. Taylor revealed that it has lower leaves with boat-shaped tips, first glume 3-nerved, second glume 5-nerved, awns 2.25–2.5 mm. long and the panicle about 7 cm. long, all of which are characteristic of the currently recognized *B. Kalmii* A. Gray. Material that has currently been interpreted as *B. purgans* does not have boat-shaped leaf tips, the first glume is 1-nerved, the second glume 3-or rarely 5-nerved, the awn 4–8 mm. long and the panicle 9–25 cm. long.

In 1839 when Gray annotated specimen 93.10, he indicated that he believed it, and also specimens 93.11 and 94.12, to be *B. purgans*. However, he apparently changed his mind, because

in 1848 when he described *B. Kalmii*, he concluded his description by saying, "this is preserved in the herbarium of Linnaeus under the name of *B. ciliatus*, though it is not the plant he described; thence has arisen much confusion". The fact that Gray proposed the specific name of *Kalmii* is, in itself, also indication that Kalm collected the plant which was being described. Thus it seems evident that specimen 93.11 is the basis for *B. Kalmii* and should be designated as the type. When Shear treated this species, he said, "There seems to be no particular specimen designated as the type of this species by Dr. Gray. The sheet in the Gray Herbarium, regarded as that upon which the original description was founded, contains portions of plants from three different localities, two from New York and one from Michigan, varying however but very little from each other. These were taken as the basis of the above description".

Through the kindness of the authorities at the Gray Herbarium, I have been able to study this same sheet of specimens; aside from the fact that it was in Gray's possession at the time of the original publication of *Bromus Kalmii*, there would appear to be no reason to designate one of the plants on the sheet as the type of the species, in preference to the Kalm specimen which was specifically cited by Gray.

Linnaeus' description of *B. purgans* is apparently a composite one taken from more than one plant. The phrase "*Panicula crispa, flexuosa, nutans*", is not applicable to any one of the three specimens in the Linnaean Herbarium. The panicles of numbers 93.10 and 93.12 (both *B. latiglumis*) may be considered as "crisp" while 93.11 (type of *B. Kalmii*) only has a flexuous, nodding panicle. Thus it is apparent that the description is a mixture including *B. latiglumis* and *B. Kalmii*. However, since specimen 93.10 is labelled "*purgans* 3 HU" in Linnaeus' handwriting and the fact that *Bromus* No. 3 in the *Species Plantarum* is *B. purgans*, it seems clear that Linnaeus apparently regarded it as representative of his description. *Bromus purgans*, therefore, should be typified by specimen 93.10 and the name is thus properly applied to the material which has currently been referred to *B. latiglumis*.

Since the name *B. purgans* L. is no longer applicable to the species which has currently been so-called, another name must

be selected to take its place. The earliest valid name is apparently *Bromus pubescens* Muhl. ex Willdenow in "*Enumeratio Plantarum Horti Regii Botanici Berolinensis*" of 1809. Several spikelets from Muhlenberg's "type" specimen (No. M154) collected in Pennsylvania were seen in the U. S. National Herbarium.

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 RHODODENDRON MAXIMUM IN NEW ENGLAND

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IT has been very interesting to bring together these New England records of *Rhododendron maximum* L. as a striking example of discontinuous distribution. The seeds of the shrub are scale-like and small and not likely to be carried far by the wind. There is some reason to assume that the shrub was once more generally distributed in New England, as is the case in the middle and southern states. Since the country was settled the beauty of the flowers has led to hacking of the shrubs, and there have been some attempts at transplanting. The Medfield, Mass. shrubs were approaching extinction when the swamp was purchased in order to protect them, and they were entirely removed from a bog in Richmond, Berkshire County, by ambitious gardeners.

It was my privilege on August 20, 1949, to visit the station for this Alleghenian shrub in Lexington, Somerset County, Maine,